FIBOCOM
Perfect Wireless Connection

G510 GPRS Module
AT Command User Manual (ADD)

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Revision History

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1 Code Convert Command

1.1 +GTCODE Code Convert Command

GB2312 code and UCS2 code can convert to each other through this AT command.

Command	Syntax	Response/Action
Set	+GTCODE=<Type>,<String>	+GTCODE: <Length> <Result> OK or: ERROR: <err>
Test	+GTCODE=?	+GTCODE: (1,2),(text) OK

The following table shows the +GTCODE parameters.

<Parameter>	Description
Type	1 – GB2312 code converted to UCS2 code, the result can be send by SMS in text mode. 2 – UCS2 code converted to GB2312 code. 3 – UCS2 code converted to GB2312 mode, but first converts the full-width in UCS2 to half-width, then converted to GB2312.
String	String to be converted Note: when Type=1, no quotation marks in String (ASCII: 0x22), and the max length is 140 bytes. When Type=2, the longest String is 280 bytes.
Length	The length of the string after converted
Result	The result of the string after converted

Note: The quotation marks (") need to be changed to \", then you can get UCS2 code.

Example:

AT+GTCODE=1,"深圳广和通"

+GTCODE: 20

6DF157335E7F548C901A

OK

AT+GTCODE=2,"
5C0A656C76845BA26237FF1A611F8C2260A8591A5E7467657684652F63013002621153F8670065B063A85
1FA4F1860E08FD48FD867E58BE2529F80FD002C4E8689E360A87684672C67084F1860E053CA8BDD8D398
FD48FD860C551B58BF756DE590D005900480046004881F3003100300030003800 36FF0C56DE590D514D8
D3930024E2D56FD79FB52A8 "

+GTCODE: 128

尊敬的客户：感谢您多年来的支持。我司最新推出优惠返还查询功能,了解您的本月优惠及话费返还情况请回复 YHFH 至 10086，回复免费。中国移动

OK

2 Multiplexer Feature

2.1 Introduction

The MUX provides multiple logical communication channels between the DTE and G510 over one physical RS232 connection. This service enables the DTE device to run multiple applications (such as GPRS, CSD, SMS and voice calls) while communicating simultaneously with the G510.

The G510 can be supports the multiplexing protocol control channel as defined in GSM07.10 and only basic mode.

Notes: The TCP/IP stack AT command doesn't support in MUX mode.

2.2 Frame Structure

All information transmitted between the TE and MS is conveyed in frames.

2.2.1 Frame Structure of Basic Mode

The basic frame structure is then as follows:

Flag	Address	Control	Length Indicator	Information	FCS	Flag
1 octet	1 octet	1 octet	1 or 2 octets	Unspecified length but integral number of octets	1 octet	1 octet

2.2.2 Flag

0xF9 for basic mode, 0x7E for advance mode. G510 only support the Basic mode

2.2.3 Address Field

The address field consists of a single octet. It contains the Data Link Connection Identifier (DLCI), the C/R bit and the address field extension bit.

1	2	3	4	5	6	7	8
EA	C/R	DLCI					

EA: use for extend the address. EA bit is always set to 1

C/R: command/response, see below.

Command/response	Direction			C/R value
Command	Initiator	-----→	Responder	1
	Responder	-----→	Initiator	0
Response	Initiator	-----→	Responder	0
	Responder	-----→	Initiator	1

DLCI: DLC ID (Data Link Connection Identifier), range from 0~63.

The DLCI is used to identify an individual user information stream as well as to identify connections between TE and MS.

2.2.4 Control Field

The content of the control field defines the type of frame.

Frame Type	BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7	BIT8
SABM	1	1	1	1	P/F	1	0	0
UA	1	1	0	0	P/F	1	1	0
DM	1	1	1	1	P/F	0	0	0
DISC	1	1	0	0	P/F	0	1	0
UIH	1	1	1	1	P/F	1	1	1
UI	1	1	0	0	P/F	0	0	0

P/F: Poll/Final bit

The poll/final (P/F) bit shall serve a function in both command frames and response frames. (In command frames, the P/F bit is referred to as the P bit. In response frames, it is referred to as the F bit.)

The poll (P) bit set to 1 shall be used by a station to solicit (poll) a response or sequence of responses from the other station.

The final (F) bit set to 1 shall be used by a station to indicate the response frame transmitted as the result of a soliciting (poll) command.

Before a station issues another frame with the P bit set to 1, it shall have received a response frame from the other station with the F bit set to 1. If no valid response frame is obtained within a system-defined time-out period, the retransmission of a command with the P bit set to 1 for error recovery purposes shall be permitted.

SABM (Set Asynchronous Balanced Mode): The SABM command shall be used to place the addressed station in the Asynchronous Balanced Mode (ABM) where all control fields shall be one octet in length. The station shall confirm acceptance of the SABM command by transmission of a UA response at the first opportunity. Upon acceptance of this command, the DLC send and receive state variables shall be set to zero.

If the responding station is not ready or unwilling to establish the particular DLC it will reply with a DM frame with the F-bit set to 1. If no UA or DM response has been received after T1 the initiating station may retransmit the SABM. This action may be repeated until a response is obtained or action is taken by a higher layer.

UA (Unnumbered Acknowledgement): The UA response shall be used by the station to acknowledge the receipt and acceptance of SABM and DISC commands.

DM (Disconnected Mode): The DM response shall be used to report a status where the station is logically disconnected from the data link. When in disconnected mode no commands are accepted until the disconnected mode is terminated by the receipt of a SABM command. If a DISC command is received while in disconnected mode a DM response should be sent.

DISC (Disconnect): The DISC command shall be used to terminate an operational or initialization mode previously set by a command. It shall be used to inform one station that the other station is suspending operation and that the station should assume a logically disconnected mode. Prior to do the command, the

receiving station shall confirm the acceptance of the DISC command by the transmission of a UA response.

2.2.5 Length Indicator

BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7	BIT8
EA	L1	L2	L3	L4	L5	L6	L7

EA: use for extend the address

When the EA bit is set to 1 in an octet, it is signifies that this octet is the last octet of the length field.

2.2.6 Information Field

The information field is the payload of the frame and carries the user data and any convergence layer information. The field is octet structured. The information field is only present in I frames, UI frames and UIH frames.

2.2.7 Frame Checking Sequence Field (FCS)

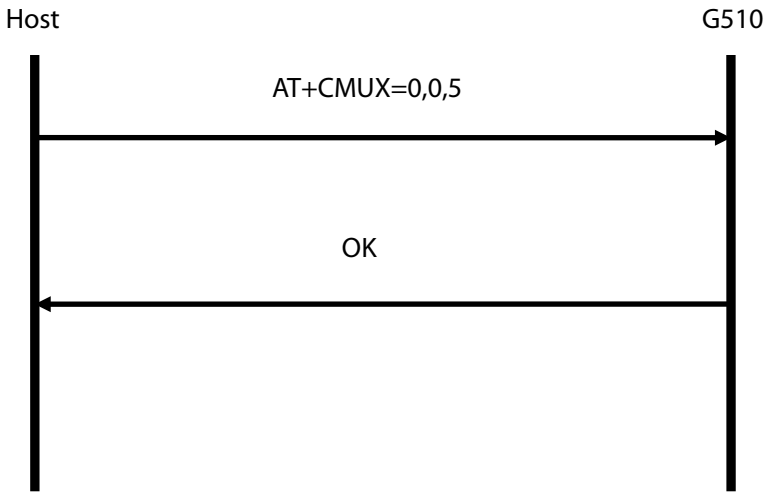
The FCS field has only one octet, the generator polynomial is: x8+x2+x+1.

For the UIH frame, the FCS shall be calculated over only the address and control fields.

For the command/response frame, the FCS shall be calculated include the address, control and length fields.

2.3 Sample

2.4 Start up Services, +CMUX, MUX Startup Command



This command is used to enable/disable the GSM MUX multiplexing protocol stack. When the G510 receives a valid +CMUX command, it will return OK and change its state to MUX-Init. If the parameters are left out, the default value is used.

Command	Syntax	Response/Action	Remarks
Set	+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]	+CME ERROR: <err>	The Set command requests the G510 to open the MUX stack with various parameters. This command works only in PREMUX state.
Read	+CMUX?	+CMUX: <mode>, [<subset>], <port_speed>,<N1>, <T1>, <N2>, <T2>, <T3>+CME ERROR: <err>	The Read command displays the current mode and settings. This command works only in MUX state.
Test	+CMUX=?	+CMUX: (list of supported <mode>s),(list of supported<subset>s),(list of supported <port_speed>s),(list ofsupported <N1>s),(list of supported <T1>s),(list ofsupported <N2>s),(list of supported <T2>s),(list ofsupported <T3>s),(list of supported <k>s)	The Test Command displays a list of supported modes and parameters. This command works in both PREMUX and MUX states.

The following table shows the +CMUX parameters.

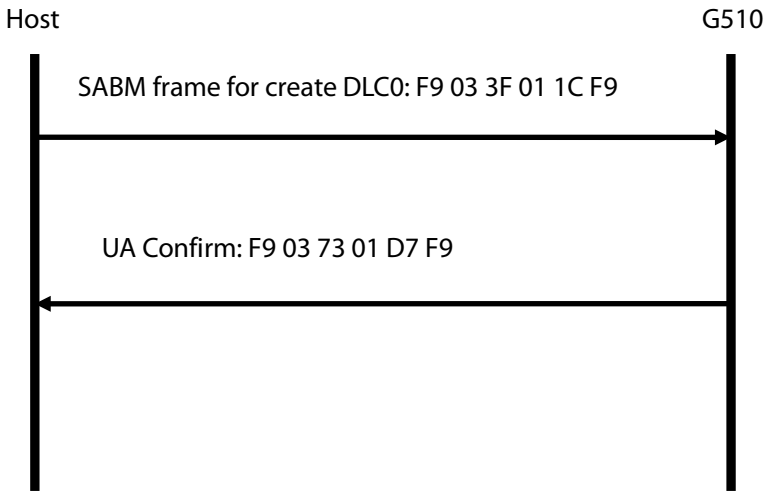
<Parameter>	Description
<mode>	MUX mode: 0 Basic
<subset>	Defines how the MUX control channel is set up. The virtual channel is set up according to this setting. 0 UIH frames used only
<port_speed>	Transmission rate: 1 9600 bit/sec 2 19200 bit/sec 3 38400 bit/sec 4 57600 bit/sec 5 115200 bit/sec 6 230400 bit/sec
<N1>	Maximum frame size: 1—1509; The default value is 31 in Basic mode.

<Parameter>	Description
<T1>	Acknowledgement timer (in units of 10 ms). 1-255 The default value is 10 (100 ms)
<N2>	Maximum number of retransmissions. 0-5 The default value is 3.
<T2>	Response timer for the DLC0 (in unit of 10 ms). <T2> must be longer than <T1>. 2-255 The default value is 30 (300 ms).
<T3>	Wake up response timer (in seconds). 1-255 The default value is 10.
<k>	Reserve for Advanced operation with Error Recovery options.

2.4.1 Establishment Services

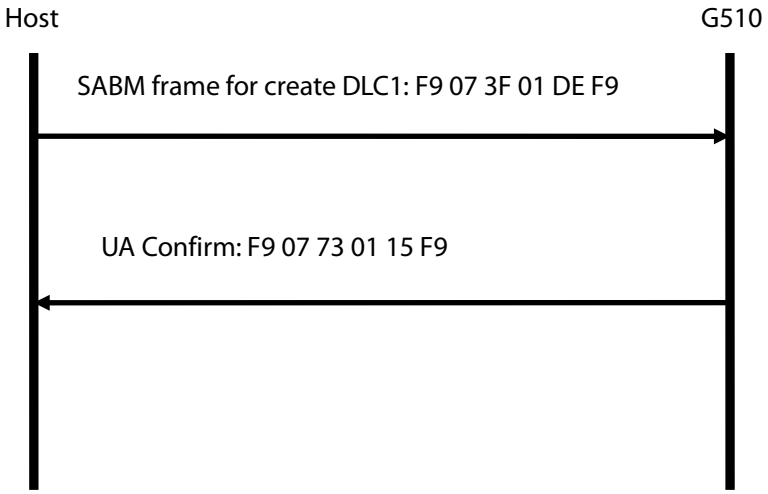
2.4.1.1 Establishment the control channel

The control channel (DLC0) must be establishment firstly after active the multiplexer by AT+CMUX.

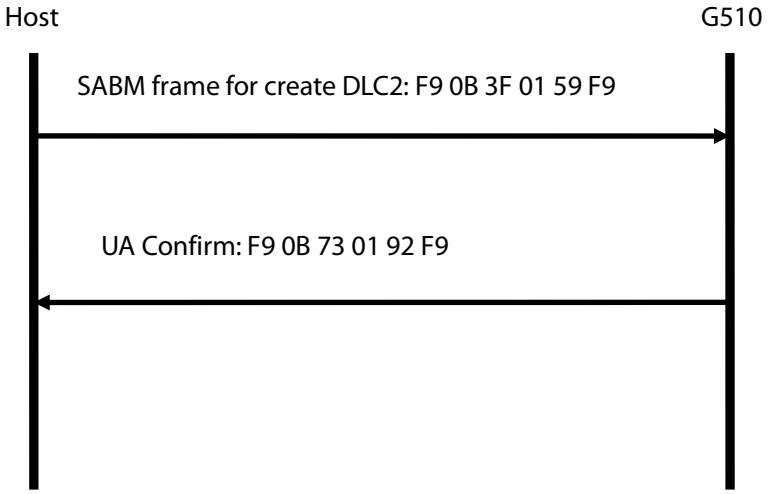


2.4.1.2 Establishment Data Channel

Establishment DLC1:



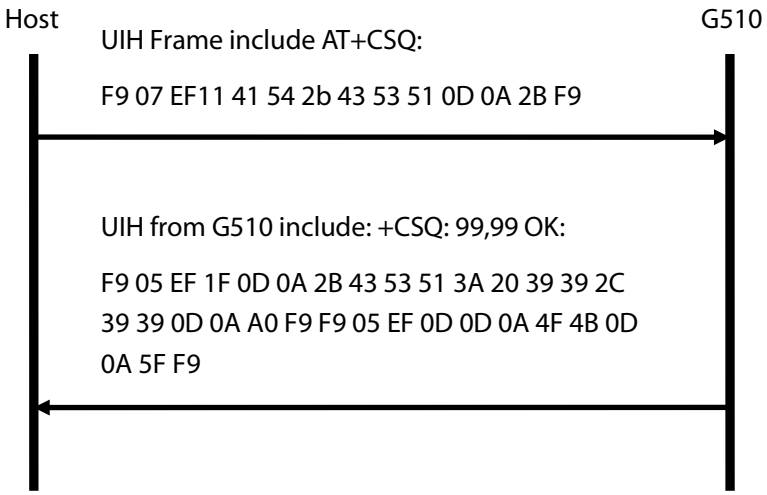
Establishment DLC2:



2.4.2 Data Services

After established the DLCx, We can send data to G510 by UIH frame.

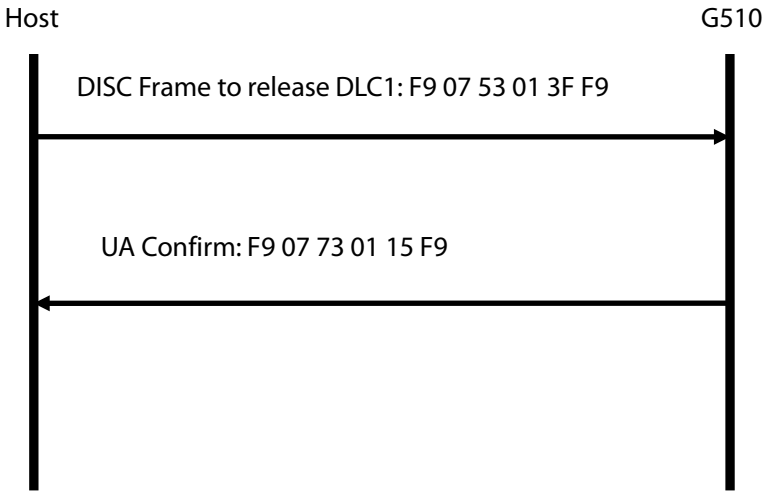
For example, send AT+CSQ from DLC1 (other DLC is similar). The frame data between host and G510 like this:


Host
G510
UIH Frame include AT+CSQ:
F9 07 EF11 41 54 2b 43 53 51 0D 0A 2B F9
UIH from G510 include: +CSQ: 99,99 OK:
F9 05 EF 1F 0D 0A 2B 43 53 51 3A 20 39 39 2C
39 39 0D 0A A0 F9 F9 05 EF 0D 0D 0A 4F 4B 0D
0A 5F F9

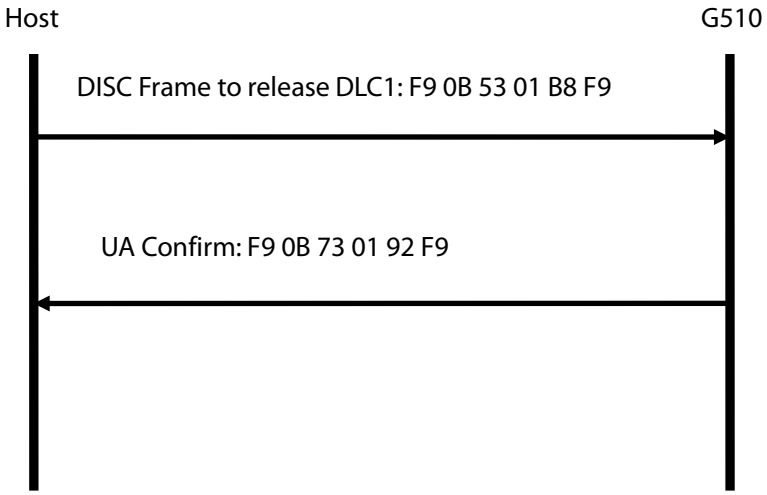
2.4.3 DLC Release Services

2.4.3.1 Release Data Channel

Release DLC1:

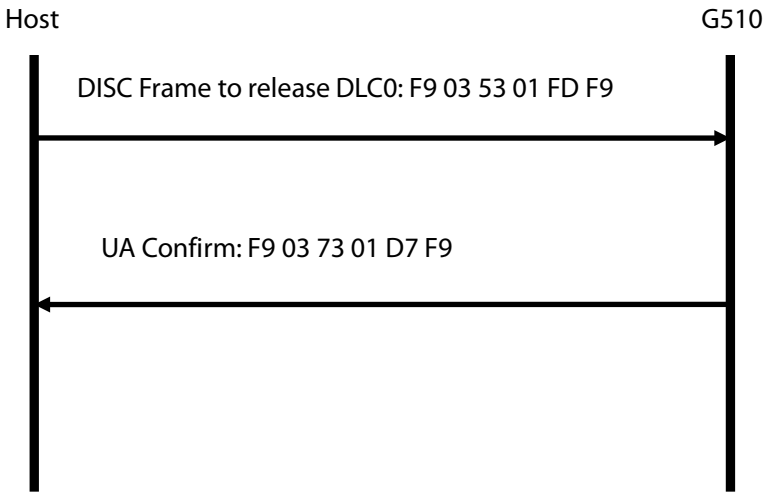


Release DLC2:



2.4.3.2 Release Control Channel

Release DLC0. After release the DLC0, G510 will close the multiplexer service and back to AT command mode.



3 LBS Command

3.1 +GTGIS, Search GIS Information in GPRS Network

This command will send a query for GIS information, receive the response and report the GIS information to user.

Note: G510 can't support this AT command when voice call established. This AT command doesn't support in MUX mode. It is recommended that we should active PDP (AT+MIPCALL=1,"xxx") firstly.

Command	Syntax	Response/Action
Set	+GTGIS=<Type>[,Language>[,<Option>]]	OK +GTGIS: <GIS Information> or: +GTGIS: <ERROR Information> or: ERROR: <err>
Test	+GTGIS=?	+GTGIS: (list of supported <Type>s), (list of supported <Language>s), (list of supported <Option>s)

The following table shows the +GTGIS parameters.

<Parameter>	Description
Type	11 –Supper mode: use GSM Cell Information for GIS query 12 –Supper mode: use Option for GIS query(Option format 1) 13 - Supper mode: use Option for GIS query(Option format 2)
Language	1-English, default value is 1 2-Chinese
Option	A String for describing both of latitude and longitude. It supports 2 formats now. For example: latitude 22.5385, longitude 113.9379 should be described : In Option format 1 as:"22.5385,113.9379"; In Option format 2 as:"2232.3143,N,11356.2741,E"

<Parameter>	Description
GIS Information	A Simple string says the GIS Information. For example: "latitude":22.5384,"longitude":113.9383,"country":"中国","country_code":"CN","region":"广东省","city":"深圳市","street":"深南大道","street_number":"1 号"
ERROR Information	A Simple string says the ERROR occur during GIS query For example: SERVER ERROR NETWORK ERROR PDP TIMEOUT

3.2 +GTSET, Super Mode Configuration

This AT command will set the destination server/port for GTGIS super mode.

With different destination server/port, the super mode of GTGIS command will return the result in different format.

Command	Syntax	Response/Action
Set	+GTSET=<future>,<value>	OK or: ERROR

The following table shows the +GTSET parameters related GTGIS super mode.

<Parameter>	Description
<future>	" GISSUPERPORT": Set the GIS destination port for super mode.
<value>	1000-30000 The default value is 5555. Before you set this parameter, please refer to GHT and make sure the port is already supported. GHT will support more and more super server port in future.
<future>	"GISSUPERSERVER": Set the GIS destination Server for super mode.
<value>	Hostname. The string length should less than 63 bytes. Default set to"szgps.xicp.net". Before you set this parameter, please refer to GHT and make sure Host is available.

4 Text to Speech

4.1 +GTTS, Text to Speech

The AT command will convert text file to speech in real-time, only supports Chinese, The maximum length is 512 bytes.

Command	Syntax	Response/Action	Remarks
Set	+GTTS=<mode>, <data>	OK or: ERROR	

The following table shows the +GTTS parameters.

<Parameter>	Description
<mode>	0: stop TTS 1: play TTS
<data>	String parameter. The data is GB code or ASC II, the maximum length is 509 bytes

Example:

AT+GTTS=0

OK

AT+GTTS=1,"012345"

OK

AT+GTTS=1,"广和通"

OK

5 DTMF, Software Decode

5.1 +GTDTMF, Software Decode

Command	Syntax	Response/Action
Set	+GTDTMF=<mode>	OK Or ERROR
Read	+GTDTMF?	+GTDTMF: <mode>
Test	+GTDTMF=?	+GTDTMF: (0-1)

The following table shows the +DTMF parameters.

<Parameter>	Description
<mode>	0: disable DTMF decode (the default value) 1: enable DTMF decode unsolicited result code +GTDTMF: <dtmf>
<dtmf>	The range of detected DTMF: 0~9, A,B,C,D,*,#

Example:

AT+GTDTMF=1

OK

+GTDTMF: * //detected DTMF *